BEHIND THE NUMBERS
EARNINGS QUALITY & DIVIDEND SUSTAINABILITY RESEARCH

BTN Research

Jeff Middleswart
jmiddleswart@btnresearch.com

Bill Whiteside, CFA
bwhiteside@btnresearch.com

October 18, 2019 | www.btnresearch.com

Contents

Has Cash Flow Topped for Defense Contractors?

Summary	p. 1
Background on FAS/CAS Accounting	p. 3
Can CAS Growth Continue?	p. 7
UTX-RTN	p. 9
LMT	p.10
NOC	p.14
Microsoft (MSFT) Earnings Quality Review	p.18

Has Cash Flow for Defense Contractors Topped Out? (UTX, RTN, LMT, NOC)

We have written about Lockheed Martin (LMT) in the past two years focusing on the changes in government reimbursement for pension plans. The defense contractors are often in a unique situation because US Government contracts normally include clauses to pay for employee pensions. These companies keep two sets of books to meet the rules of traditional Financial Accounting Standards (FAS) and the US Government's Cost Account Standards (CAS). This interplay between FAS and CAS penalized income and cash flow more heavily in years prior to 2013, but then as the two systems moved closer together – income and cash flow rose rapidly at these companies as the CAS income caught up. The issue now is the transition is complete and the companies have also boosted dividends and repurchases. That rate of growth may be difficult to maintain as the cash flow growth stalls. We also

added a look at this issue for Raytheon (RTN) (which is being acquired by United Technologies (UTX)), and Northrup Grumman (NOC).

- FAS pension income/expense is the normal pension line items people are used to seeing under GAAP. It is a non-cash item.

- CAS is pension expenses reimbursed by the government. It is a cash item and comes to the company via revenues as contracts are paid. The companies report a FAS/CAS reconciliation in calculating the net income/expense for pensions.

- FAS rules have changed in terms to give companies more relief from falling discount rates that push up pension obligations, which in turn require larger funding payments.

- CAS rules have changed so that the discount rates match those of FAS and companies can be reimbursed more quickly for shortfalls. As these rules took effect, it boosted the growth in CAS income faster than FAS expense and created a rising source of income and cash flow for the companies.

- Raytheon has seen FAS/CAS switch from being a 9%-12% drag on operating income to over providing over 10% of operating income in some years. On cash flow, pension funding has moved from a $1 billion drag to essentially neutral/positive cash flow. Adjusting for pension changes, cash flow is actually flat.

- Raytheon is merging with United Technologies and that rising cash flow stream from CAS changes is a key part. The problem we see is CAS growth is stalling and Raytheon still has an underfunded pension to contribute cash towards. At the same time, the roughly $3 billion in base cash flow is already consumed by the dividend on the new UTX shares and capital spending. The remaining $0.9 billion in cash flow is all due to elevated CAS, and some of that will need to go towards pension contributions and UTX historically likes to buy shares too.

- Lockheed Martin was one of the harder hit companies under the old CAS rules and has seen a sizeable turnaround as CAS has caught up. FAS/CAS income went from being negligible to about 25% of operating income.

- LMT made sizeable contributions to its pension plans in 2018, which should cover contributions for 2019 and 2020 also. As a result, its cash flow continues to rise with

higher CAS and smaller cash outflows to pensions. The company has boosted its spending on dividends, repurchases, and capital spending to over $5 billion annually. Cash flow should be strong in 2019 and 2020 (over $6 billion). However, LMT may need to start making pension contributions again as it still has an $11.3 billion pension funding shortfall.

- Northrop-Grumman's change in accounting to recognize actuarial losses more quickly with new rules resulted in a sizeable hit to retained earnings in 2018 but also eliminated one of the larger drags on income from amortizing losses. This is all non-cash, but the change in income has been significant in restated 2016, 2017, and 2018 results.

- We have focused more heavily on NOC's cash flow situation as that has not changed with the new policies and we see a company that is getting about 15% of cash flow from rising CAS income net of pension contributions. Its cash needs in dividend, capital spending, and a history of large share repurchases is over $3 billion against a cash flow from operations that isn't much higher and driven by CAS.

- In all three situations, we think LMT has the best chance of seeing more growth in what it returns to shareholders going forward. However, all these companies appear to have grown dependent on rising CAS income and the transition to friendly rules and faster payments is now complete. They also all have pension shortfalls to cure which may divert more of the slowing growth CAS income into the area.

Basic Background on this Accounting:

We addressed this in our April 19, 2018 issue with Lockheed Martin. But we are going to revisit it here and keep it simple before going into specific companies. We are looking at three primary variables here: FAS, CAS, and cash funding of Pension Contributions.

- FAS – Financial Accounting Standards
    - Impacts income as a source of non-cash income or expense.
    - It is now split with Service Cost in operating income and other components in non-operating income. 100% impacts on pretax and net income.
    - Is added back to cash from operations.

- The total cost/benefit is primarily the sum of Service Cost (new benefits earned) + Interest Cost (Last year's Pension Benefit Obligation multiplied by the Assumed Interest Rate) – Expected Rate of Return (Last year's Assets in the Pension multiplied by the Assumed rate)

- CAS – Cost Accounting Standards
  - Pension Cost computed using the Government's standards that is billed to the government as a reimbursable expense.
  - Shows up on the income statement as revenue – it is paid as part of the total contract.
  - It is cash revenue and boosts income. The only potential to make this less than 100% cash is if part of it was booked as revenue and the receivable simply has not been paid at the time the books were closed.
  - It is not subtracted from cash from operations

- Pension Contributions
  - These are a combination of cash payments both mandatory and voluntary made by the company into the pension plans
  - The minimum amount required involves comparing PBO (Pension Benefit Obligations) to Pension Assets. Shortfalls in funding are supposed to be cured within 7-years.
  - The size of the shortfall or overfunding level is heavily dependent on the Interest rate assumptions to compute the PBO.
  - Contributions are a drag on Cash from Operations but do not impact income, but can have tax savings impacts.

We will use Raytheon as an example of what has been happening and how this plays out in income and cash flow. We are splitting the FAS into both components as the company now reports it as Service Cost as part of operating income and Retirement Benefits non-Service Expense below the operating income line. Here is the new way it is reported for operating income:

New Presentation	2018	2017	2016	2015	2014	2013	2012	2011	2010
FAS Service Cost	-$504	-$473	-$482	-$537	-$448	-$579	-$516	-$471	-$442
CAS	$1,919	$1,764	$1,508	$1,368	$1,176	$987	$838	$733	$666
FAS/CAS	$1,415	$1,291	$1,026	$831	$728	$408	$322	$262	$224

In 2018 and restated back for 2017 and 2016, this new treatment is now reported. We adjusted the years back to 2010 for an apples-to-apples comparison. Notice immediately how rapidly this has become a huge source of rising profits after 2013. $200-$300 million per year is now $1.4 billion. This has become over 30% of operating income vs. 8% in 2010 and 2011. Total operating income has risen $1.5 billion from 2010 to 2018 with $1.2 billion coming solely from this source.

Under the old accounting treatment, FAS/CAS would incorporate all of FAS components into operating income. Under this situation, the FAS/CAS has gone from a negative impact on earnings to a positive contribution:

Old Presentation	2018	2017	2016	2015	2014	2013	2012	2011	2010
FAS Service Cost	-$504	-$473	-$482	-$537	-$448	-$579	-$516	-$471	-$442
FAS non S/C	-$1,230	-$913	-$601	-$649	-$447	-$661	-$577	-$602	-$454
CAS	$1,919	$1,764	$1,508	$1,368	$1,176	$987	$838	$723	$666
FAS/CAS	$185	$378	$425	$182	$281	-$253	-$255	-$340	-$230

Under this treatment, operating income in 2016-18 was $3.3 billion. So, the FAS/CAS became 6-13% of operating income. In 2012 and 2011, operating income was $2.8-$2.9 billion with at $250-$340 million drag on results from the pensions. That was 9%-12% negative. Remove pension impacts in all years, we'd argue that operating income hasn't grown in basically a decade. The new presentation really only changes operating income. Net income still incorporates all parts of FAS under either the old or new system of reporting.

Let's look at how much FAS/CAS has been adding to cash flow. On cash flow, the FAS service cost and FAS non-service cost are non-cash so they are added back. They would still provide a tax-shield. The CAS would still come in from the income statement and remain. The company would need to make the required cash contributions to the pension plans as an offset to that CAS cash flow.

	2018	2017	2016	2015	2014	2013	2012	2011	2010
FAS/CAS	$185	$378	$425	$182	$281	-$253	-$255	-$340	-$230
Est. Tax Shield	$39	$132	$149	$64	$98	-$89	-$89	-$119	-$81
CAS	$1,919	$1,764	$1,508	$1,368	$1,176	$987	$838	$733	$666
Less Req Contrib.	$889	$615	$145	$339	$650	$778	$721	$1,078	$1,084
Est. Impact on CFO	$991	$1,017	$1,214	$965	$428	$298	$206	-$226	-$338
Additional Contrib.	$1,272	$1,027	$525	$222	$620	$322	$519	$768	$750
Total Impact on CFO	-$281	-$10	$689	$743	-$192	-$24	-$313	-$994	-$1,088
Reported CFO	$3,428	$2,745	$2,852	$2,359	$2,184	$2,378	$1,957	$2,107	$1,942

There is much going on here so let's make this easier to read:

- The FAS/CAS is from the prior table and there to calculate the estimated tax shield
- We know the CAS stayed in cash from operations and required cash contributions came out of cash from operations
- The estimated impact on CFO nets the tax shield of FAS/CAS with CAS less required contributions
- Additional contributions were made as well, those would have been in CFO too and need to be pulled out to determine the full impact of pensions on CFO
- Comparing the last two lines shows the full impact on pensions to reported CFO, which we do in the next table

Just like income, FAS/CAS was penalizing cashflow back in 2010-11, based on just CAS less required contributions. It was a $200-$300 million drag. That was followed by several years of CAS rising faster than FAS and the required contributions declining as the fall in discount rates slowed and helped stem the rise in PBO. That resulted in CFO rising by basically $1 billion over the last four years due to pension rule changes. That is quite a turn from the $200-$300 million drag.

To its credit, Raytheon tried to stay in front of the still falling discount rates and contribute even larger amounts to the pension plan to eliminate more of the underfunding status. In 2010-11, the total drag on pensions became over $1 billion. By 2015-16, Raytheon was still adding $700 million to cash flow even with the voluntary payments. Higher payments in 2017-18, made the pension impact almost neutral to cash flow.

	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total Impact	-$281	-$10	$689	$743	-$192	-$24	-$313	-$994	-$1,088
Reported CFO	$3,428	$2,745	$2,852	$2,359	$2,184	$2,378	$1,957	$2,107	$1,942
CFO w/o Pensions	$3,709	$2,755	$2,163	$1,616	$2,376	$2,402	$2,270	$3,101	$3,030

What we see is a company that had underlying cash flow of about $3 billion as this problem began. It has not reached that figure since. **In 2018, cash flow had over $800 million come in as a result of boosting payables and taxes payable. Through the first half of 2019, CFO is down over $1 billion fueled largely by $800 million reversing in payables and taxes payable.** It is also worth noting that the 1H19 saw CFO drop $1 billion despite only paying $196 million into pensions vs. $488 million in 1H18. Thus, we think growth in reported cash flow from $2 billion to $3 billion from 2010-18 essentially disappears when adjusting for the pension situation and while cash flow has improved of late, it still is at levels seen in 2010-11.

What Caused This Sudden Growth in CAS and Can It Continue?

As the FED began to aggressively cut interest rates after 2008, most US companies saw the discount rate to calculate their pensions start to fall rapidly as well. The discount rate was tied to a two-year average of high-grade corporate bond yields. The lower the discount rate – the faster their PBO (Pension Benefit Obligation) grew. At the same time, the Pension Protection Act was requiring these rising short-falls in pension funding be cured with 7-year plans. Thus, the FAS expense was rising rapidly as was the required funding contributions.

All US companies were given some relief with MAP-21. This allowed companies to use a 25-year average of bond yields, rather than 2-years. That helped the PBO stay lower and also slowed the growth of FAS expense. This deal has been extended multiple times and modified to include a weighted-average life of bonds used to match the duration of the pension liabilities. The goal remains to continue widening a band that the 25-year average must fall outside of to continue using vs. returning to the 2-year average of bonds. We wrote about this in our September 5, 2019 report on pensions. We won't belabor this point for the defense companies too.

The issue for the defense companies was they were being paid for their pensions via CAS. Under CAS, the discount rate being used was the expected rate of return on the pension assets. That assumption was not declining at anything close to how fast bond yields were declining. Furthermore, CAS was always paying pension obligations even before 2008 and if long-term assumptions were proving to be too low to fully cover the obligations – CAS was very slow to pay for the adjustments.

In 2013, CAS Harmonization was brought about to help the government contractors. Here's what that did:

- The CAS discount rate changed from expected rate of return to the yield on high-yield bonds also – thus lower interest rates would boost the PBO under CAS too and more closely match FAS. It would also be easier to justify to the government that the prior assumptions were unrealistic, and they could start to bill larger amounts to cure shortfalls

- CAS moved to amortize gains and losses from 15 years to 10 years. This more closely matched the 7-year period to cure shortfalls under the Pension Protection Act that the defense companies had to meet under FAS. This sped up the higher payments from CAS.

- CAS also allowed for immediate increases to be billed if they were written into the union contract. Giving employees wage increases didn't require a period of time to lapse before making the case that assumptions for future obligations was outpacing the original forecasts. This also sped up funding from CAS.

- These changes were phased in over five years 0% in 2013 and then 25% in each year to 100%.

All of these changes with CAS Harmonization allowed both sets of books to more closely match on the same variables. It also allowed the companies to recover costs that were exceeding forecasts more quickly. The transition to 100% CAS Harmonization is now complete. Here's a potential problem, Raytheon is forecasting billings for CAS to slow significantly going forward:

	2023e	2022e	2021e	2020e	2019e	2018	2017
Expected CAS	$1,803	$2,013	$1,974	$1,921	$1,887	$1,919	$1,764
Growth rate	-10%	2%	3%	2%	-2%	9%	16%

One other minor change that some of the companies have adopted is Mark-to-Market pension expense/benefit for actuarial gains/losses. In the past, these actuarial gains/losses were recorded in accumulated other comprehensive loss/income. They were then amortized into future earnings if they fell outside a defined range. Under the new policy, the gains/losses are more rapidly recognized and put into accumulated other comprehensive loss/income. It will still be amortized into future earnings. What we have seen, this has

had fairly minor impacts on earnings where applied– as in $10-$15 million vs. hundreds of millions in changes from the FAS and CAS rules.

We want to look at all three of these companies more closely individually. We think the amount they are spending on dividends and repurchases has been boosted in many cases due to the FAS/CAS changes and wonder if those growth rates are still sustainable.

Raytheon Being Acquired by United Technologies – UTX May Only Be Buying CAS Cash Flow on a Net Basis

Continuing with tables above, where we used Raytheon as an example – the first thing we wanted to check are differences in pension assumptions:

Pension Assumptions	UTX '18	UTX '19	RTN '18	RTN '17
PBO discount rate	4.0%	3.4%	4.3%	3.7%
Interest Expense	3.0%	3.3%	3.7%	4.3%
Exp. Rate of Return	6.8%	7.3%	7.4%	7.4%

These will impact FAS. Both companies cut their PBO by boosting their discount rates last year. We have written before that was largely due to volatility in the market at the end of 2018 and expect the rates to decline in 2019. A 50bp drop for RTN's discount rate would add $1.4 billion to PBO. More importantly, the RTN pension plan is underfunded by $6.1 billion already or 24%, boosting the PBO should boost the underfunded level too and could boost the cash flow that needs to be allocated to pension assets. UTX is only 7% underfunded.

Cutting the interest rate for expense to 3% and the expected rate of return to 6.8% is unlikely to have a major impact. Assuming the Service Cost remains about $500 million where it has been – here is the estimate for the basic parts of pension cost:

	2019e	2018	2017	2016
Service Cost	$500	$504	$473	$482
Interest	$807	$1,004	$1,088	$1,089
Ex Return	-$1,314	-$1,435	-$1,377	-$1,505
Total Cost	-$7	$73	$184	$66

The main FAS costs should actually benefit from the changes by a nearly $100 million. Also, on remaining FAS costs, the loss on settlements in 2018 was $286 million and may be an outlier while the amortization of prior actuarial losses has been over $1 billion and growing – that my grow another $150 million. The net result – pull main FAS cost down -$80, eliminate last year's -$286 settlement loss and boost the actuarial loss by $150 – the FAS cost at RTN falls basically $200 million if it adopts assumptions similar to UTX.

The company has already said it will see CAS fall slightly. The net impact of RTN's pension may actually become a short-term tailwind for UTX.

Cash flow may be a different story. Remember in the table above on cash flow, RTN has been producing about $3 billion in cash from operations before the impact of pensions. Pensions are likely be a sizeable cash producer in 2019 because RTN is expected to only contribute $356 million. Even with CAS coming down slightly to under $1.9 billion, the $356 million in cash outflow is a far cry from the $2.2 billion in 2018 and $1.6 billion in 2017. The pension funding situation could make CFO rise from $3.0 billion to about $4.5 billion in 2019.

We think that recovery may be a one-time event. First, $1.0 billion of $1.25 billion of the additional payment in 2018 was allocated specifically to offset required payments in 2019 and 2020. In 2018, required payments were $889 million and that was with the PBO increasing via a higher discount rate. If the discount rate declines to match market rates and the lower rate used by UTX – we think the PBO increases along with the underfunding level. Thus, we expect required contributions to increase going forward and the company will have used up much of its prepayment in 2019. That should make the pension contribution from cash flow closer to $800 million - $1 billion against CAS of $1.9 billion.

On a sustainable basis, UTX may be buying $3 billion in cash flow plus $900 million in net CAS cash flow. Capital spending has been rising and is expected to come in at $1.1 billion. So, $3.9 billion in cash flow less $1.1 billion leaves $2.8 billion in free cash flow. The new UTX shares issued to RTN investors will cost $1.9 billion in dividends or a 70% payout ratio of free cash flow. **In actual terms, the only free cash flow after the dividend UTX may receive from the merger is $900 million in net CAS less pension contributions.** UTX investors have also had a history of expecting share repurchases and it is possible that RTN's pension contributions could rise to higher levels too – either situation could consume the remaining cash flow.

Lockheed Martin - $5 billion Contribution to Pensions Last Year, Lets It Pocket CAS cash in 2019 and 2020, Beware of Rising Cash Needs as Pension Contributions Return

Lockheed adopted the same FAS/CAS presentation whereby only service cost is reported for FAS in operating income. The remaining components of expense are below the operating income line. We will show the new method for the company to be consistent, but the company gives guidance for FAS/CAS under the old method. Under the old method, it is expecting $1.5 billion for 2019 vs $1.1 billion in 2018. Because we are more focused on cash flow, we will also show the old method which includes the FAS costs now below the operating income line because that full amount is what is added back in cash flow:

New Presentation	2018	2017	2016	2015	2014	2013	2012	2011	2010
FAS Service Cost	-$630	-$635	-$671	-$875	-$903	-$1,142	-$1,055	-$974	-$903
CAS	$2,433	$2,248	$1,921	$1,527	$1,520	$1,466	$1,111	$899	$988
FAS/CAS	$1,803	$1,613	$1,250	$652	$617	$324	$56	-$75	$85

LMT has been driving down its service costs by:

- Stopping new non-union enrollees hired after December 2005
- Freezing future benefits for non-union employees starting in 2016

The result has been a significant increase of FAS/CAS operating income that has had a significant bump from CAS rising at the same time. Operating income before FAS/CAS was $5.6 billion in 2018 and $4.9 billion in 2017 under the new method. That makes the $1.8 and $1.6 billion in FAS/CAS 25% of operating earnings.

Op Inc Impact	2018	2017	2016
Adj. Op. Income	$7,430	$6,546	$5,968
less New Method FAS/CAS	$1,803	$1,613	$1,250
Op. Inc. before Pensions	$5,627	$4,933	$4,718
% of Op. Income	24%	25%	21%

In the past, it was almost negligible:

Op Inc Impact	2012	2011	2010
Adj. Op. Income	$4,482	$4,156	$4,325
Add back full FAS/CAS *	-$830	-$922	-$454
Op. Inc. before Pensions	$5,312	$5,078	$4,779
New Method Pension **	$56	-$75	$85
% of Op. Income	1%	-1%	2%

- Full FAS/CAS comes from the table below – old method

** New Method FAS/CAS comes from the table above

So, under the new method, FAS/CAS has gone from a 1% impact to 25% impact from 2011 to 2018. At the same time, total operating income before pensions is essentially flat.

Under the complete cost method with the older presentation, the improvement has been substantial, but the rate of gain has slowed since 2016.

Old Presentation	2018	2017	2016	2015	2014	2013	2012	2011	2010
FAS Total Cost	-$1,431	-$1,372	-$1,019	-$1,127	-$1,144	-$1,948	-$1,941	-$1,821	-$1,442
CAS	$2,433	$2,248	$1,921	$1,527	$1,520	$1,466	$1,111	$899	$988
FAS/CAS	$1,002	$876	$902	$400	$376	-$482	-$830	-$922	-$454

The slow-down in growth has come from falling assumptions that drive the other components of pension cost/income under FAS. Also, LMT has been amortizing more accrued losses into the total FAS pension cost – those have become essentially 100% of FAS expense:

Pensions	2018	2017	2016	2015	2014	2013	2012	2011	2010
Service Cost	$630	$635	$671	$875	$903	$1,142	$1,055	$974	$903
Interest Cost	$1,740	$1,835	$1,890	$1,791	$1,912	$1,800	$1,884	$1,918	$1,876
Exp. Rtn Assets	-$2,395	-$2,249	-$2,539	-$2,734	-$2,693	-$2,485	-$2,187	-$2,033	-$2,027
Normal Pen. Cost	-$25	$221	$22	-$68	$122	$457	$752	$859	$752
Actuarial Losses	$1,777	$1,506	$1,359	$1,599	$1,173	$1,410	$1,116	$880	$595
Amortized Prior S.C	$321	$355	$362	$389	$151	$81	$73	$82	$95

If LMT sees the amount of actuarial losses or amortized prior service cost decline – it should help fuel earnings further. So, the company is guiding to $1.5 billion in FAS/CAS in 2019 under the old method vs. $1.0 billion in 2018. That is expected to come from CAS rising $200 million to $2.6 billion, and FAS costs falling $300 million from $1.4 billion. When we first wrote about this situation at LMT in our April 19, 2018 report – we noted LMT was

going to continue to benefit from FAS/CAS driving earnings. That seems likely to continue as well at least another year or two.

On the Cash Flow, we know FAS is not cash and CAS is. Offsetting that is pension contributions.

	2018	2017	2016	2015	2014	2013	2012	2011	2010
FAS/CAS	$1,002	$876	$902	$400	$376	-$482	-$830	-$922	-$454
Tax Shield	$210	$307	$316	$140	$132	-$169	-$291	-$323	-$159
CAS	$2,433	$2,248	$1,921	$1,527	$1,520	$1,466	$1,111	$899	$988
Contributions	$5,000	$46	$23	$5	$2,000	$2,250	$3,837	$2,285	$2,240
Est. Impact on CFO	-$2,777	$1,895	$1,582	$1,382	-$612	-$615	-$2,436	-$1,063	-$1,093
CFO	$3,138	$6,476	$5,189	$5,101	$3,866	$4,546	$1,561	$4,253	$3,801
CFO before Pensions	$5,915	$4,581	$3,607	$3,719	$4,478	$5,161	$3,997	$5,316	$4,894

Unlike Raytheon, LMT made huge contributions to the pension from 2010-13 and as the new rules came into play, it was about to dramatically lower contributions for several years. The company announced it would pay in $5 billion in 2018 to take advantage of the favorable tax shield and does not expect to pay in more in 2019, so we expect cash flow to rise above $6 billion with CAS going up to $2.6 billion and no outflows.

While we do not expect any immediate concerns with LMT, longer-term, there are issues. Basically, the company has set itself and investors' expectations to anticipate over $5 billion in outflows for capital spending, dividends, and share repurchases annually:

	2018	2017	2016	2015	2014	2013	2012	2011	2010
Cap Exp	$1,278	$2,277	$1,063	$939	$845	$836	$942	$987	$1,074
Dividend	$2,347	$2,163	$2,048	$1,932	$1,760	$1,540	$1,352	$1,095	$969
Repurchases	$1,492	$2,001	$2,096	$3,071	$1,900	$1,762	$990	$2,465	$2,420
Total Spent	$5,117	$6,441	$5,207	$5,942	$4,505	$4,138	$3,284	$4,547	$4,463

The current dividend is $2.7 billion, capital spending is running higher than last year, so those two items are over $4.0 billion. LMT still has $2.5 billion in authorized share repurchases after buying $500 million in the 1H19. With no pension contributions in 2019, the company should be able to cover its cash needs.

We will simply remind investors to remain aware of the pension remains very underfunded. The PBO of $43.3 billion exceeds assets by $11.3 billion which is 26% of the PBO. It is also

an indication that while cash flow may be above $6 billion when LMT gets to put 100% of CAS income in its pocket – it will need to pay that $11.3 billion eventually. The $5 billion contribution likely covers 2019 and 2020 at least. But history shows that LMT often contributes more than $2 billion per year to the pension plan. That would cause a sizeable decline in cash flow at the same time the company is boosting dividends and buying back shares to enhance shareholder return.

Northrop-Grumman - Heavy Share Repurchases Are Expected, but Make Cash Flow Figures Tight going Forward

We are going to turn the topic order around as we look at Northrop-Grumman and focus the most on cash flow. The reason for that is their income changes have been sizeable. The company's changes to adopt Mark-to-Market pension changes vs. amortizing accruals outside a boundary into income are creating widely divergent results for income. Moreover, the reconciliation includes other accounts within a catch-all hit to retained earnings. We don't have the starting figures to follow it through either. So essentially, the income impact of FAS/CAS has become $1.3 billion in 2017 on a restated figure vs. $0.6 billion in 2017. Accounts from the 2017 10-K have vanished and become part of a catch-all. It all balances in that cash flow is the same but looking at the changes to income has become much more than simply adjusting the service cost only FAS/CAS to operating income as opposed to total Pension Cost FAS/CAS.

Let's start backwards in the discussion of NOC's pension funding. NOC bought Orbital ATK last year and that company came with an underfunded pension plan. Assets were $2.3 billion vs. $2.9 billion in PBO. The total company now has an unfunded plan of $5.1 billion which is 16% of PBO. The CAS income is over $1 billion and the contributions are very sporadic between almost $0 and $600 million. Either way, NOC's pension plan shortfall will require some time to cure – longer than LMT and RTN at that rate of contribution.

At the same time, we know NOC has very little cushion on cash flow vs. outflow. This is key because regardless of income changes, the cash flow is the same through all the accounting changes and we know the outflows are the same:

	2018	2017	2016	2015	2014	2013	2012	2011
Cap Exp	$1,249	$928	$920	$471	$561	$364	$331	$492
Dividend	$821	$689	$640	$603	$563	$545	$535	$543
Repurchases	$1,263	$393	$1,547	$3,182	$2,668	$2,371	$1,316	$2,295
Total Spent	$3,333	$2,010	$3,107	$4,256	$3,792	$3,280	$2,182	$3,330
CFO	$3,827	$2,613	$2,813	$2,162	$2,593	$2,483	$2,640	$2,115

Right now, the dividend is $900 million, and the capital spending is forecast at $1.2 billion. Obviously, the share repurchases are a big part of what shareholders are expecting. At a minimum, that is $1 billion – so cash needs are well over $3 billion.

We know CAS income and we know the contributions. We are not going to speculate on the tax impacts for cash flow as we will discuss we're not comfortable with the income accounting rule changes. We know FAS/CAS income is an income source – so taxes would lower the net figure:

	2018	2017	2016	2015	2014	2013	2012	2011	2010
CAS	$1,017	$1,026	$847	$703	$384	$542	$506	$638	$471
Contributions	$370	$596	$81	$578	$19	$12	$366	$1,084	$789
Pretax Cash Flow Net CAS	$647	$430	$766	$125	$365	$530	$140	-$446	-$318
CFO	$3,827	$2,613	$2,813	$2,162	$2,593	$2,483	$2,640	$2,115	$2,453

So, let's look at this two ways: under the prior method FAS/CAS has been $300-$600 million in recent years. Under the new method, it's $1.3-$1.6 billion. Take 21% of either and cut it off either $100 or $300 in taxes from Net CAS. Net CAS is running about 9%-15% of CFO. Here's the extra problem – NOC is forecasting CAS at only $770 million in 2019 vs. over $1 billion the last two years. That knocks $250 million off of CFO right there plus maybe another $100 from taxes. Just that takes CFO under $3.5 billion – the dividend is $900 million and Cap-Ex is $1.2 billion. That leaves under $1.4 billion to cover higher contributions to the pension and stock repurchases. That already looks much tighter to us.

We also want to note that the $3.8 billion cash flow in 2018 vs. $2.6 billion in 2017 looks high due to several changes. We know they bought Orbital ATK for half the year in 2018 and income rose $400 million and depreciation added another $300 million. Deferred taxes consumed $750 million in cash and offset that. That left pension benefit accounting changes to add $1.2 billion to cash flow as cash flow rose $1.2 billion. In 1H19 vs 1H18 before the acquisition – cash flow is basically flat. So, we're also not convinced that $3.8 billion is the

starting point to look at NOC. If it's closer to $3 billion and FAS/CAS is set to decline by $300 million – the cash needs are still increasing.

Now let's look at the income changes that are tough to reconcile because old accounts have vanished. Here is what prior FAS/CAS looked like:

	2017	2016	2015	2014	2013	2012	2011	2010
FAS	$432	$531	$355	$115	$374	$374	$238	$461
CAS	$1,026	$847	$703	$384	$542	$506	$638	$471
Net FAS/CAS	$594	$316	$348	$269	$168	$132	$400	$10

So, it was a source of income – that is completely in-line with the others. And it rose over time as CAS payments accelerated.

Here is what the new method has become – which puts service cost and CAS in operating income and other parts of pension cost/income below the line. We only have 2016-2018 results:

	2018	2017	2016
FAS Service Cost	$404	$388	$390
Other FAS	-$1,049	-$699	-$611
CAS	$1,017	$1,026	$847
FAS/CAS	$1,662	$1,337	$1,068

So, FAS/CAS went from $594 million to $1.34 billion in 2017 and from $316 million to $1.07 billion in 2016 on the restatement. The company changed the service cost and the interest cost on the accounting change from amortizing accumulated losses within a set range into income over time to recognizing actuarial gains/losses into income. This is why the FAS/CAS has been modified widely.

	2017 new	2016 new	2017 old	2016 old
Service Cost	$388	$390	$424	$446
Int. Cost	$1,250	$1,302	$1,234	$1,284
Exp. Return	-$1,885	-$1,853	-$1,885	-$1,853
Amortiz Prior Service Cost	-$57	-$60	-$57	-$60
MTM Expense	-$445	$1,041	$0	$0
Amortiz actuarial losses	$0	$0	$712	$714
Other	-$7	$0	$4	$0
Net	-$756	$820	$432	$531

The reconciliation combines several non-pension accounts. In 2017, the company notes that operating income is being restated due to -$53 million from ASC 606, a positive $30 million from ASU 2017 (which is pensions) and a -$58 million due to the accounting change. There are two accounting changes being listed in the same line. Non-Service Pension expense dropped $44 million, but the accounting change was listed as $743 million. We know they recognized many accrued actuarial gains/losses into income with mark to market and charged it against retained earnings. All of that is non-cash.

Essentially, they wrote off a large amount of accrued losses all at once that were being amortized at $700 million per year. Other companies make adjustments and they are $10 million. NOC is the one where we are now seeing FAS/CAS income literally double. The y/y FAS equation should stabilize going forward in our view.

This is why we are not going to make many conclusions on NOC's income until we see more information. Instead, we are going to focus on actual cash flow. With that in mind, and NOC's guidance for CAS income to fall – we believe the cash coverage to maintain the same level of stock repurchases and is unlikely as pension funding may grow at the same time.

Microsoft EQ Review

Current EQ Rating*	Previous EQ Rating
4-	na

6- "Exceptionally Strong"
5- "Strong"
4- "Acceptable"
3- "Minor Concern"
2- "Weak"
1- "Strong Concerns"

Note that a "+" sign indicates the earnings quality improved in the most recent quarter while a "–" sign indicates deterioration

*For a more detailed explanation of the EQ Review Rating scale, please refer to the end of this report

We initiate earnings quality coverage with a rating of 4- (Acceptable)

- Overall, we do not see significant warning signs in MSFT's accounting. However, as we note below, we do flag a decline in unearned revenue days in its Intelligent Cloud segment which accounts for the 4- rating rather than a 4+.

- Like many software companies, MSFT's revenue recognition requires a large amount of judgment in determining what portions of revenue are recognized upfront and what portion is recognized over time. This is complicated in MSFT's case by 1) the mix of revenues related to products linked to cloud services such as Office 365 which are recognized over time versus products with more on-premises components which are recognized up-front and 2) large, longer-term contracts with products such as Azure in which contract details may limit upfront billing which can deflate unearned revenue relative to revenue and bookings. Management has warned to expect volatility in bookings and unearned revenue as a result.

- Management gives quarterly forecasts for the upcoming quarter's commercial unearned revenue balance and the company has met or exceeded those forecasts in the last several quarters. However, we note that unearned revenue days of sales in the Cloud Services segment declined by more than 3 days in the 6/19 quarter which was the first year-over-year decline in several quarters. The company did cite growth in large commercial Azure contracts with less billed upfront as well as higher than expected on-premises contracts, both of which would have depressed unearned revenue. Still, quarterly sales growth did appear to benefit from the revenue mix.

Managements forecast for commercial unearned revenue and Intelligent Cloud sales would seem to indicate another decline in unearned revenue days will be coming in the 9/19 quarter.

- Reported cash flow from operations grew by 19% in the fiscal year ended 6/19, but the growth falls to 9% after adjustment for working capital movements including an $18 million payment last year for the TCJA. More importantly, free cash flow growth has been stunted by a rapid rise in capex due to the company's buildout of its cloud infrastructure. Capex as a percentage of sales has risen from 8.4% of sales in 2017 to 11.1% in 2019 which is a more than $6 billion drain on free cash flow growth. While this should continue to rise, the rate of spending growth has declined considerably in the last few quarters, in line with management's expectation for a moderation in the spending increase. This should provide a tailwind to free cash flow growth moving forward. The dividend only consumes 36% of free cash flow and there is a surplus of cash after the buyback as well indicating both are easily sustainable at the current pace.

- A decline in amortization expense has added about 1.3 cps to EPS in both of the last two quarters. This is somewhat puzzling given the addition of GitHub's intangibles to the mix in the 12/18 quarter and we suspect it is related to technology assets picked up in the 2016 acquisition of LinkedIn becoming fully amortized. We do not view this as a material concern at this point as the benefit was not a material factor in the 16 cps and 14 cps earnings beats posted in the 6/19 and 3/19 quarters, respectively.

- Sales and marketing expense as a percentage of sales has been declining and fell 110 bps in the 6/19 quarter. Management indicated that the 4% increase in spending in fiscal 2019 was driven by increased investment in commercial sales infrastructure, GitHub and LinkedIn which was offset by lower marketing. We are skeptical that the company will be able to continue to cut marketing expense without negatively impacting sales, especially if it wants to continue to drive sales growth in consumer areas such as Surface, Xbox, and Consumer Office products.

- Other income was approximately $140 million higher than management forecasted due to mark-to-market gains on its equity portfolio. This added another 1.3 cps to earnings in the period which was also not material to the 16 cps earnings beat.

Revenue Recognition

The software business has changed significantly over the last few years. Software used to be primarily a standalone product that was purchased once, installed on a computer or server, operated independently at the customer's location. Now, much of the software on the market may have a portion of the product that is loaded on the customer's computer at the time of purchase but is heavily dependent on a constant flow of information with the software company's servers (cloud-based). Rather than updates being purchased when released, they are now part of a package of services which are licensed along with the software on a subscription basis.

MSFT must identify the nature of each component of its software products when determining how to recognize revenue from each one. The company describes this as follows in its 10-K:

> *"When a cloud-based service includes both on-premises software licenses and cloud services, judgment is required to determine whether the software license is considered distinct and accounted for separately, or not distinct and accounted for together with the cloud service and recognized over time.* ***Certain cloud services, primarily Office 365, depend on a significant level of integration, interdependency, and interrelation between the desktop applications and cloud services, and are accounted for together as one performance obligation. Revenue from Office 365 is recognized ratably over the period in which the cloud services are provided."***

While the cloud-based offerings like Office 365 are relatively straight-forward and are all recognized over time, the company does have some commercial "hybrid contracts" which do contain components that are recognized up-front with the remainder recognized over time. In addition, some commercial contracts for products such as Azure or certain storage products are licensed on a volume basis where revenue is recognized as the customer utilizes the service. However, any usage over and above the contracted amount are charged at a contracted rate and the revenue associated with such an overage is recognized in the period it occurs.

To make it more complicated, the company is striking more longer-term contracts related to cloud services, particularly with Azure and commercial services. These large contracts can result in huge boosted to reported billings. However, the details of some of these longer-term contracts may not provide for large billings up front which leads to a more muted impact on

both the amount of revenue recognized upfront as well as the amount that is booked as unearned revenue. Changes in the mix of contracts signed can lead to quarterly lumpiness in how much revenue is deferred in unearned revenue versus being recognized in revenue. Amy Hood, MSFT's CFO, gave a good description of this in the 9/18 quarter conference call:

> *"And so what that means is you'll see some volatility in that,* ***and you're also going to see some volatility in commercial unearned specifically because whenever you see hybrid strength it won't land as much in unearned.*** *So as the business gets bigger and we do bigger and larger deals and some of them are on-prem and some of them are in Azure, you're going to see volatility frankly in both of those. But what I try to do is think about the impact of all the key datapoints, which is how do we in quarter, how did we do on the unearned revenue on the balance sheet, and how do we do in overall bookings. And if I triangulate between all those three, just like I did in Q4, I feel really good about our commercial performance.*
>
> *Our commercial revenue annuity mix increased 1 point year over year to 90 percent. Commercial unearned revenue was $27.3 billion, growing 22 percent and 21 percent in constant currency, in line with expectations. On an expiry base that was roughly flat year over year, commercial bookings were better than expected and increased 15 percent and 16 percent in constant currency benefiting from larger, long-term Azure contracts, growth in Azure consumption overages and pay as you go contracts, and strength in on-premises revenue.* ***These contract types impact bookings, reported revenue, and unearned revenue in different ways – let me explain. First, under ASC 606, hybrid and on-premises offerings drive bookings growth and more in-period revenue recognition, therefore there is less impact on unearned revenue. Second, growth in Azure consumption overages and pay as you go contracts drive bookings growth and in-period revenue but have little impact on unearned revenue. And finally, long-term Azure contracts drive significant bookings growth but have a smaller impact on in-period revenue and unearned revenue.*** *The inclusion of LinkedIn results was immaterial to the growth rates of commercial unearned and commercial bookings."*

Clearly, the percentage of revenues from a new booking that is deferred will be impacted by the product type as well as the details of the contract. Analysts must be aware of all these factors when interpreting quarterly results.

On a historical note, on July 1, 2017, the company chose to early-adopt ASC 606 for revenue recognition. The biggest impact related to revenue from *Windows 10*. Revenues for that

operating system had previously been recognized mostly over time. However, under ASC 606, it was deemed appropriate to recognize the revenue up-front. MSFT also elected to restate historical results for the change which led to a massive $6.6 billion increase in revenue in fiscal 2017 (ended 6/30) and a $2.5 billion increase for provision for income taxes. This has since lapped and is not materially impacting currently comparable, results but analysts building models must be very careful to utilize restated results prior to the 6/17 quarter particularly for sales, receivables, unearned revenue.

Analysis of Unearned Revenue Trends

As noted above, there are several factors including the product, customer type and contract details that can significantly impact the percentage of revenue that is recognized up-front versus how much is deferred in a given quarter. Management focuses its quarterly presentation on trends in its commercial bookings, commercial cloud revenue, and commercial unearned revenue in its quarterly slide presentations and conference call discussions. The following table shows the last six quarters of details provided on the slides:

	6/30/2019	3/31/2019	12/31/2018	9/30/2018	6/30/2018	3/31/2018
Reported Commercial Bookings Growth	22.0%	30.0%	18.0%	15.0%	18.0%	26.0%
Commercial Unearned Revenue	$34,108	$25,093	$25,317	$27,298	$30,113	$21,127
Commercial Unearned Revenue Growth	13%	19%	20%	22%		
Commercial Revenue Annuity Mix	90%	90%	89%	90%	90%	89%
Commercial Cloud Revenue	$11,000	$9,600	$9,000	$8,500	$7,900	$6,800
Commercial Cloud Gross Margin %	65%	63%	62%	62%	59%	58%

MSFT gives specific guidance on commercial unearned revenue targets for the upcoming quarter in each call. The actual numbers have either exceeded or been in-line for the last few quarters. CFO Amy Hood stated during the conference call:

> *"Even with the higher mix of larger, long-term Azure contracts with low upfront billings, commercial unearned revenue was in line with expectations at $34.1 billion, up 13% and 16% in constant currency. And this quarter, our annuity mix was again 90%."*

Despite commercial unearned revenue rising 13% and matching expectations, it still lagged sales growth in many commercial product lines. The company breaks out "commercial cloud" revenue in the slides, but not total commercial revenue. Therefore, we can't calculate a true

commercial unearned revenues days of sales figure. However, the commercial cloud revenue growth rate of almost 40% clearly indicates that a portion of commercial revenue outran the portion of revenue set aside as unearned. MSFT discloses the revenue growth rate of several key product lines with some of the largest commercial lines shown below:

	Sales Growth
Office Commercial Products and Cloud Services	14%
LinkedIn	25%
Dynamics Products and Cloud Services	12%
Server Products and Cloud Services	22%
Azure	64%

We can see further evidence of a low rate of revenue deferral in business segment detail provided by the company. The following table shows segment revenue, segment unearned revenue, and unearned revenue days of sales by segment.

Segment Revenue	6/30/2019	3/31/2019	12/31/2018	9/30/2018	6/30/2018	3/31/2018	12/31/2017
Productivity and Business Processes	$11,047	$10,242	$10,100	$9,771	$9,668	$9,006	$8,953
Intelligent Cloud	$11,391	$9,649	$9,378	$8,567	$9,606	$7,896	$7,795
More Personal Computing	$11,279	$10,680	$12,993	$10,746	$10,811	$9,917	$12,170
Total Revenue	$33,717	$30,571	$32,471	$29,084	$30,085	$26,819	$28,918
Segment Unearned Revenue							
Productivity and Business Processes	$16,831	$12,679	$12,635	$13,753	$14,864	$11,185	$11,290
Intelligent Cloud	$16,988	$12,531	$12,551	$13,298	$14,706	$9,987	$9,759
More Personal Computing	$3,387	$2,925	$2,898	$3,191	$3,150	$2,783	$2,760
Total Unearned Income	$37,206	$28,135	$28,084	$30,242	$32,720	$23,955	$23,809
Segment Unearned Revenue Days							
Productivity and Business Processes	139.0	113.0	114.2	128.4	140.3	113.3	115.1
Intelligent Cloud	136.1	118.5	122.1	141.6	139.7	115.4	114.2
More Personal Computing	27.4	25.0	20.4	27.1	26.6	25.6	20.7
Total Unearned Revenue Days	100.7	84.0	78.9	94.9	99.2	81.5	75.1

Note that each business segment contains both commercial and consumer components so a direct comparison from a single segment to the commercial unearned revenue number is not possible.

We see in the bottom panel of the above table that total unearned revenue days rose slightly to 100.7 from 99.2 a year ago. However, unearned days for Productivity and Business Processes fell slightly to 139.0 from 140.3. Productivity and Business Services contains such

products as Office Commercial, Office 365, Office Consumer (including 365), LinkedIn and the Dynamics business.

However, unearned revenue days fell 3.6 days in the Intelligent Cloud segment. This segment includes mostly commercial server products, Enterprise Products which includes support services and consulting, and most notably, Azure. Intelligent Cloud corresponds the closest to management's above commentary regarding the dynamics of large, hybrid commercial cloud service contracts which can impact the amount of revenue deferred versus recognized. While management has warned investors to expect quarterly volatility in such unearned revenue balances, it is worth noting that the 3.6-day drop in unearned days in the Intelligent Cloud segment is the first year-over-year decline in the last several quarters. As noted above, the company specifically cited a larger number of large, long-term contracts for Azure as well as higher than expected sales for its on-premises server business which would have resulted in more revenue being recognized upfront. Management has warned that there will be volatility in unearned revenue and the account did meet expectations. However, the drop in unearned revenue in the segment shows that the target was for a relatively low increase in unearned revenue relative to sales. Clearly, Intelligent Cloud revenue booked in the quarter did enjoy a boost from a larger percentage of sales being recognized rather than deferred.

Given the extent to which management focuses on its disclosures and discussion of factors impacting the deferrals, we are not overly concerned that investors are being misled by aggressive accounting. However, these measures are important to monitor and investors should remember that volatility goes both ways. We should see some periods where less revenue is recognized upfront and the unearned days figure increases. Therefore, we will be concerned if we see sustained declines in unearned revenue trends. We note that the forecast for unearned commercial revenue calls for another 12% increase over last year while its forecast for Intelligent Cloud sales implies about 23% growth. This is likely heralding another drop in unearned revenue days.

Adjusted Cash Flow Growth and Rising Capex

Operating cash flow for the fiscal year ended 6/19 rose by 18.9% over the year-ago period. However, last year's number was penalized by an $18 billion tax payment related to the enactment of the TCJA. After adjustment for this and other smaller working capital movements, operating cash flow rose by just over 9%.

Perhaps the most important current development in relation to cash flow is the rise in capital spending being driven by the company's buildout of infrastructure to support its rapidly growing cloud business. The following table shows capital spending as a percentage of revenue for the last three fiscal years.

Capital Spending

	6/30/2019	6/30/2018	6/30/2017
Reported Operating Cash Flow	$52,185	$43,884	$39,507
Capital Spending	$13,925	$11,632	$8,129
Free Cash Flow	$38,260	$32,252	$31,378
Capex % of Revenue	11.1%	10.5%	8.4%
Gross PPE	$71,807	$58,683	$47,913
Accumulated Depreciation	$35,330	$29,223	$24,179
Net PPE	$36,477	$29,460	$23,734
Depreciation Expense	$9,700	$7,700	$6,100
Avg Age	3.6	3.8	4.0
Depreciation % of Gross PPE	13.5%	13.1%	12.7%

Capex has jumped from 8.4% of revenue to more than 11% in the last three years. This has been a $5.8 billion drain on free cash flow growth. At the same time, depreciation expense as a percentage of gross PP&E has risen as most of this spending has been focused on computer equipment and software necessary to drive the cloud buildout. These items are depreciated over 2-3 years which is shorter than other asset classes. We can see the buildout in computer equipment and the associated buildings and improvements in the PP&E breakout below:

	2019	2018	2017
Land	$1,540	$1,254	$1,107
Buildings and Improvements	$26,288	$20,604	$16,284
Leasehold Improvements	$5,316	$4,735	$5,064
Computer Equipment and Software	$33,823	$27,633	$21,414
Furniture and Equipment	$4,840	$4,457	$4,044
Total at Cost	$71,807	$58,683	$47,913

Capital expenditures are expected to continue to climb to meet the growing demand for cloud services, but the growth rate is expected to moderate. MSFT issues quarterly capex forecasts with the forecast for the 9/19 quarter calling for capex to be roughly flat with the 6/19

quarter. This implies an approximate 6% year-over-year increase. The following table shows the growth rate for quarterly capex spending the last several quarters:

	6/30/2019	3/31/2019	12/31/2018	9/30/2018	6/30/2018	3/31/2018	12/31/2017	9/30/2017
Capex YOY Growth Rate	1.8%	-12.6%	43.3%	68.9%	74.3%	73.1%	30.1%	-1.4%

The 6% forecast for the 9/19 quarter represents an acceleration over the last two quarters, but it does continue a clear trend in decelerated capex spending and lines up well with management's expectations for a continued increase in spending but at a moderating pace. If the trend lasts, it will provide a boost to free cash flow growth and an increase in dividend coverage.

Regarding dividend coverage, MSFT's dividend consumes only about 36% of free cash flow and that figure has remained fairly stable over the last several quarters.

Dividend Cover

	6/30/2019	6/30/2018	6/30/2017
Free Cash Flow	$38,260	$32,252	$31,378
Cash Spent on Dividends	$13,811	$12,699	$11,845
Dividend % FCF	36.1%	39.4%	37.7%
Share Repurchases	$19,543	$10,721	$11,788
Cash After Dividends & Repurchases	$4,906	$8,832	$7,745
Cash from Stock Option Exercises	$1,142	$1,002	$772
Share Count	7,753	7,775	7,806
growth	-0.3%	-0.4%	

MSFT does maintain a generous share repurchase program partly to counter dilution from its stock compensation plans although it does result in a slight reduction of the share base. Still, there is a healthy cushion of cash left after the dividend and buyback and both are clearly sustainable at the current pace.

Lower Amortization Expense

The following table shows amortization of intangibles for the last eight quarters:

	6/30/2019	3/31/2019	12/31/2018	9/30/2018
Quarterly Amortization Expense	$383	$431	$530	$556

	6/30/2018	3/31/2018	12/31/2017	9/30/2017
Quarterly Amortization Expense	$515	$560	$562	$563

The lower amortization expense added about 1.3 cps to earnings growth in the last two quarters. This should be considered a non-operational benefit, but it was not a material factor in the 16 cpc and 14 cps earnings beats the company posted in those two periods.

The company does not give an explanation for the decline in amortization expense. Almost all the company's intangible assets are related to the 12/8/16 acquisition of LinkedIn in which it booked $7.9 billion of intangibles and its 10/25/18 acquisition of GitHub in which it booked $1.3 billion in intangibles. The following shows the breakdown in intangibles and amortization periods for the two deals:

	GitHub		LinkedIn	
Customer Related	$648	8 yrs	$3,607	7 yrs
Technology-Based	$447	5 yrs	$2,109	3 yrs
Marketing Related	$170	10 yrs	$2,148	20 yrs
Contract Based	$2	2 yrs	$23	5 yrs
Total	$1,267	7 yrs	$7,887	9 yrs

The decline in amortization seems unusual given the addition of GitHub's intangibles to the amortized pool of intangibles in the 12/18 quarter. We can only speculate that the decline in amortization expense was a result of certain technology-based intangibles from the LinkedIn acquisition becoming fully-amortized.

We also note that while the company is choosing to amortize its GitHub technology assets over 5 years rather the 3 years it chose for LinkedIn, the lower period used for GitHub's marketing related intangibles more than makes up for that as the overall weighted average amortization period for GitHub's intangibles is two years lower than the comparable figure for LinkedIn. On the surface, this seems to imply a more conservative accounting treatment as the lower amortization period results in about $40 million more in annual amortization expense. However, MSFT booked 63% of the LinkedIn purchase price as unamortized goodwill and 29% as amortized intangibles. However, 73% of the GitHub deal was booked as goodwill while only 17% was booked as amortized intangibles. If 73% of the GitHub purchase price was subject to amortization, it would result in about $130 million a year

more in amortization expense. This is only about 1.3 cps on an annual basis making it a relatively immaterial issue.

We also praise MSFT for not adding amortization of acquired intangibles back to its non-GAAP earnings as so many of its technology peers are prone to do.

Lower Sales and Marketing

MSFT has been enjoying lower marketing expense as a percentage of sales for the last several quarters as shown in the following table:

	6/30/2019	3/31/2019	12/31/2018	9/30/2018
Sales	$33,717	$30,571	$32,471	$29,084
Sales and Marketing	$4,962	$4,565	$4,588	$4,098
Sales & Marketing % of Sales	14.7%	14.9%	14.1%	14.1%

	6/30/2018	3/31/2018	12/31/2017	9/30/2017
Sales	$30,085	$26,819	$28,918	$24,538
Sales and Marketing	$4,760	$4,335	$4,562	$3,812
Sales & Marketing % of Sales	15.8%	16.2%	15.8%	15.5%

Sales and marketing expense as a percentage of sales ran in the 15-16% range through the 2016-2017 time frame, so the decline to the 14% range is unusual. The company stated that the 4% increase in spending on sales and marketing for the fiscal year was driven by increased investments in commercial sales capacity, GitHub, and LinkedIn which was partially offset by a decline in marketing. We are skeptical that the company will be able to continue to cut marketing expense without negatively impacting sales, especially if it wants to continue to drive sales growth in consumer areas such as Surface, Xbox, and Consumer Office products.

Other Income Rises

Other income/expense was $191 million in the quarter. While this is down from the year-ago quarter's $301 million, it was below the company's forecasted $50 million as a result of recording higher-than-anticipated mark-to-market gains on equity investments in its

portfolio. This only amounted to about 1.3 cps so it was not a material component of the 16 cps earnings beat in the quarter.

Explanation of EQ Rating Scale

Rating	Description
6- "Exceptionally Strong"	Indicates uncommonly conservative accounting policies to the point that revenue and earnings are essentially understated relative to the company's peers. Higher possibility of reporting positive earnings surprises
5- "Strong"	Indicates the company has no areas of concern with its reported results and we see very little risk of the company disappointing due to recent results being overstated from aggressive reporting in recent periods.
4- "Acceptable"	Indicates the company may have exhibited a minor "red flag", but the severity of the issue is not yet a concern. Minimal risk of an earnings disappointment resulting from previous earnings or cash flow overstatement
3- "Minor Concern"	Indicates the company has exhibited either a larger number of or more serious warning signs than companies receiving a 4. The likelihood of an immediate earnings or cash flow disappointment is not considered to be high, but the signs mentioned deserve a higher degree of attention in the future.
2- "Weak"	Indicates the company's recently reported results have benefitted materially from aggressive accounting. Follow up work should be performed to determine the nature and extent of the problem. There is a possibility that upcoming results could disappoint as the impact of unsustainable benefits disappears.
1- "Strong Concerns"	Indicates that the company's recent results are significantly overstated and that we view a disappointment in upcoming quarters is highly likely.

In addition to the numerical rating, the EQ Review Rating may also include either a minus or plus sign. A minus sign indicates that our analysis shows the overall earnings quality of the company has worsened since the last review and there is a possibility the numerical rating will fall should the problem continue into the next quarter. Likewise, a positive sign indicates that the overall earnings quality is improving, and the company may see an upgrade in its numerical rating should the trend continue.

Key Points to Understand About the EQ Score

The EQ Review Rating is much more than a blind, quantitative scoring method. While we utilize proprietary adjustments, ratios, and methods developed over decades of earnings quality analysis, the foundation of all of our analysis is reading recent SEC filings, press releases, conference call transcripts and in some cases, conversations with managements.

The EQ Review Rating is not comparable to a traditional buy/sell rating. The Rating is intended to specifically convey the extent to which reported earnings may be over/understated. Fundamental factors such as forecasts for future growth, increasing competition, and valuation are not reflected in the rating. Therefore, a high score does not in itself indicate a company is a buy but rather indicates that recent results are a good indication of the underlying earnings and cash generation capacity of the company. A low score (1-2) will likely result in us performing a more thorough review of fundamental factors to determine if the company warrants a full-blown sell recommendation.

Disclosure

BTN Research is a research publication structured to provide analytical research to the financial community. Behind the Numbers, LLC is not rendering investment advice based on investment portfolios and is not registered as an investment adviser in any jurisdiction. Information included in this report is derived from many sources believed to be reliable (including SEC filings and other public records), but no representation is made that it is accurate or complete, or that errors, if discovered, will be corrected.

The authors of this report have not audited the financial statements of the companies discussed and do not represent that they are serving as independent public accountants with respect to them. They have not audited the statements and therefore do not express an opinion on them. Other CPAs, unaffiliated with Mr. Middleswart, may or may not have audited the financial statements. The authors also have not conducted a thorough "review" of the financial statements as defined by standards established by the AICPA.

This report is not intended, and shall not constitute, and nothing contained herein shall be construed as, an offer to sell or a solicitation of an offer to buy any securities referred to in this report, or a "BUY" or "SELL" recommendation. Rather, this research is intended to identify issues that investors should be aware of for them to assess their own opinion of positive or negative potential.

Behind the Numbers, LLC, its employees, its affiliated entities, and the accounts managed by them may have a position in, and from time-to-time purchase or sell any of the securities mentioned in this report. Initial positions will not be taken by any of the aforementioned parties until after the report is distributed to clients, unless otherwise disclosed. It is possible that a position could be held by Behind the Numbers, LLC, its employees, its affiliated entities, and the accounts managed by them for stocks that are mentioned in an update, or a BTN Thursday Thoughts.